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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

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FOREST INSECT SURVEY - YOSEMITE NATIONAL PARK

SEASON OF 1945

by

John E. Patterson

Forest Insect Laboratory
Berkeley 4, California
January 18, 1946

SUBJECT—

INDEX NO.—

U. S. DEPARTMENT OF AGRICULTURE
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SEASON OF 1945

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INFESTATION CONDITIONS IN 1944.

During the year 1944, bark beetle infestations in the Park were generally static with a slight tendency toward increase in beetle populations. Slightly increased losses occurred on a few areas where local conditions apparently fostered this trend. In the areas where the 1943 infestations were influenced by the Power Line burn, or by local blowdowns, above normal losses occurred during the early part of the season. Outside such areas, losses were only slightly increased over 1943. This situation generally prevailed in stands of all species despite the pronounced upward trend registered in adjoining stands; to the north on the Stanislaus forest and south on the Sierra forest. The answer to why similar conditions did not develop in the Park forests is found in the yearly application of a control policy which the Park Service inaugurated some years ago when annual maintenance control was applied to high recreational areas. This plan of insect control is particularly applicable in recreational forests where esthetic values are principally at stake. Its effectiveness has been fully demonstrated in this Park.

Maintenance control work carried out in 1944 was located in the principal use areas of Yosemite Valley floor, Big Meadows, Wawona road screen, and in both Mariposa and Merced big tree groves. A total of 205 brood trees, containing a volume of 702,920 board feet, were treated by the peel-burn method. Of this total, 45 trees were on the Power Line burn area or in its confines, and 67 trees were in blowdown areas in Crane Creek and Grouse Creek basins. The treated total included 155 ponderosa pine and 50 sugar pine trees. Total cost of the control work was \$4,875.86. Per tree cost was \$23.78 and \$6.94 per M board feet.

FIELD EXAMINATION 1945.

Survey of insect conditions in 1945 was extended through the main recreation areas only. Due to other commitments, many of the outlying areas which are usually included were omitted this year. However, since no critical conditions were observed or reported in any remote sections of the Park, the survey was deemed adequate for current forest management purposes. The field examinations were made by J. M. Miller, G. R. Struble and J. E. Patterson of the Berkeley laboratory, Bureau of Entomology and Plant Quarantine; and by Forester M. E. Thede of the National Park Service. Examinations were made intermittently from August 15 to December 10.

Areas Examined.

The survey covered the recreational areas in the pine belt from Mariposa Grove to Carlon, Badger Pass and Bridalveil Meadows region, Yosemite Valley, and the alpine stands around Lake Tenaya and Tuolumne Meadows.

Survey Methods.

The general overall appraisal of current loss conditions was gained principally from general reconnaissance, road and trail traverse supplemented by observations from points of visibility. Measured losses and infestation characteristics were obtained from cruise of roadside plots of which several were utilized, sampling infestations in all the pine species. The loss data on roadside plots are summarized in Table 1.

Current Insect Trends and Losses.

In general infestations throughout the Park forests remained in endemic status, registering slight increases in certain local areas such as Yosemite Valley and the lodgepole pine stands of Bridalveil Creek. Conversely slight decreases occurred in Big Meadows, in the road screen along the Wawona Road, and in the Jeffrey pine stands surrounding the valley rim. Elsewhere in the pine stands there was little or no change from previous conditions. Infestations in the fir forests of the higher elevations were decidedly endemic in all these stands.

Insects Involved in Current Losses.

As in the past the most prominent insects involved in the pine losses were the western pine beetle, Dendroctonus brevicomis Lec., attacking ponderosa pine; and the mountain pine beetle, D. monticolae Hopk., attacking sugar pine and lodgepole pine. *Ips* spp. were also involved in a minor role in these attacks. Mortality of Jeffrey pine resulted from attacks by the Jeffrey pine beetle, D. jeffreyi Hopk. Attacks on fir, both white and red, were made by the fir engraver beetle, Scolytus ventralis Lec., and the Sierra fir borer, Tetropium abietis Fall. With the exception of the mountain pine beetle, none of these insects developed aggressive infestations anywhere in the Park. Attacked trees were not grouped but were widely scattered. Concentrated, aggressive, attacks by the mountain pine beetle were noted locally in lodgepole pine in Bridalveil Meadows and near White Wolf.

AREAS REQUIRING SPECIAL ATTENTION.

In addition to those areas where maintenance control work is desirable, there are others where infestation conditions indicate early epidemic losses. The course of infestations in these cases should be closely watched to detect an approach to critical loss conditions. Lodgepole pine stands on local areas in Bridalveil Meadows, near White Wolf and Harden Lake, and in Tuolumne Meadows fall in this category. During 1945 attacks were aggressive and heavily concentrated, resulting in group kills of mature lodgepole pine. These group attacks are regarded as significant sources of an expanded infestation in the immediate future.

Other Insect Problems.

The lodgepole pine needleminer, Recurvaria milleri Busck., persists in a few small localized areas of the High Sierra. However, there has been no recent spread from the old centers located at Forsyth Pass and Cathedral Lake. This infestation is decidedly endemic and without indication of early change from current status. This needleminer has completely disappeared from the last previous epidemic center on Porcupine Flat where trees were severely defoliated during the period 1934 to 1939. The active pockets north of Tuolumne Canyon were not visited during the season.

CONTROL RECOMMENDATIONS FOR 1945-1946.

In conformity with the bark beetle control policy effective during recent years in Yosemite Park, a limited amount of maintenance control work is again recommended on the principal recreational areas. While current infestations are not causing abnormal losses, they are damaging to the extent that many mature trees of high park value are dying from current attacks. Maintenance control is insurance against recurrence of such losses and should prevent increase in succeeding infestations. It is fully warranted by the values at stake. This form of control is recommended on the following areas during the fall-winter-spring period of 1945-46.

- Unit 6. Yosemite Valley. Approximately 9,000 acres to be covered. Estimated over-winter infestation amounts to about 30 trees, principally ponderosa pine.
- Unit 5. Merced Grove. A few infested sugar pine trees of large size should be treated to break up this small center.
- Unit 2. Mariposa Grove and Wawona Basin. About 8,000 acres to be worked. Scattered infestation consisting of about 30 trees, both sugar pine and ponderosa pine.
- Units 3 and 4. Wawona Road screen, approximately 10,000 acres. Overwintering infestation is estimated at 80 trees - ponderosa pine, sugar pine and Jeffrey pine.
- Unit 5. Big Meadows. This unit should be recleaned to eliminate the residual infestation resulting from breedup on the Power Line burn and to supplement the last control work carried out near Crane Flat. Approximately 10,000 acres are involved. Control work will include treatment of about 60 infested trees.

The total number of infested trees involved in the maintenance control recommended for the current season is estimated at 205 trees. The control areas will total about 38,000 acres of recreational forests. Control work for the season was begun by Park crews under the supervision of Forester Thede early in November and is in progress at this time. It can be continued through the winter and spring periods until April 15; thus there is ample time to complete all the work recommended before emergence of the overwintering broods next spring.

Table 1. Recorded pine losses sustained on roadside plots in 1944 and 1945

Area	Unit	Sample	Acres	Tree Spp.	Trees killed in 1944			Trees killed in 1945		
					Complete Record			Partial Record		
					Trees	Volume	Volume/ac.	Trees	Volume	Volume/ac.
A	Wawona	Road count (RD-1)	144	PP	2	1,560	11	3	2,750	19
				SP	$\frac{1}{3}$	$\frac{780}{2,340}$	$\frac{5}{16}$	$\frac{1}{4}$	$\frac{1,310}{4,060}$	$\frac{9}{28}$
	Alder Creek	Road count (RD-2)	120	PP	3	9,180	76	3	10,800	90
				SP	$\frac{1}{4}$	$\frac{1,200}{10,380}$	$\frac{10}{86}$	$\frac{2}{5}$	$\frac{1,910}{12,710}$	$\frac{16}{106}$
	Alder Creek	Road count (RD-3)	160	PP	5	11,470	71	2	1,040	6
				SP	$\frac{2}{7}$	$\frac{1,180}{12,650}$	$\frac{7}{78}$	$\frac{1}{3}$	$\frac{1,820}{2,860}$	$\frac{11}{17}$
	Mariposa	Road count (RD-10)	120	PP	0			0		
B	Mariposa	Road count	16	SP	2	19,470	162	1	6,240	52
	Chinquapin	Road count (RD-4)	160	PP	0			0		
				SP	0			0		
	Chinquapin	Road count (RD-12)	160	PP	3	5,170	32	2	3,000	20
				SP	$\frac{1}{4}$	$\frac{2,250}{7,420}$	$\frac{14}{46}$	$\frac{1}{3}$	$\frac{1,680}{4,680}$	$\frac{10}{30}$
	Chinquapin	Road count (RD-12)	160	PP	0			2	360	2
				SP	$\frac{1}{1}$	$\frac{80}{80}$	$\frac{\frac{1}{2}}{\frac{1}{2}}$	$\frac{2}{2}$	$\frac{360}{360}$	$\frac{2}{2}$
	Big Mdws.	Road count (RD-5)	224	PP	2	500	2	2	1,500	7
				SP	$\frac{8}{10}$	$\frac{49,460}{49,960}$	$\frac{221}{223}$	$\frac{2}{4}$	$\frac{5,280}{6,780}$	$\frac{23}{30}$
	Big Mdws.	Road plot (RD-6)	104	PP	3	6,590	63	0		
				SP	$\frac{0}{3}$	$\frac{6,590}{6,590}$	$\frac{63}{63}$	$\frac{1}{1}$	$\frac{2,500}{2,500}$	$\frac{24}{24}$
	Yosemite Vly.	Road plot (RD-14)	120	PP	3	1,210	10	1	450	4
				SP	0			0		
	Yosemite Vly.	Road plot (RD-15)	76	PP	2	840	11	3	1,640	21
				SP	0			0		
	Bridalveil	Road plot (RD-13)	44	LP	12	5,460	124	8	2,460	56
	El Capitan	Road plot (RD-8)	140	JP	2	880	6	0		
C	White Wolf	Road plot (RD-9)	44	LP	3	510	12	0		
	Tenaya	Road plot (RD-16)	60	LP	1	50	1	0		
	Tenaya	Road plot (RD-17)	96	LP	4	420	4	0		
	Tuolumne	Road plot	120	LP	7	1,640	14	0		

Table 2. Estimated bark beetle-caused losses in pine on reporting areas for the years 1944 and 1945.

Reporting Area	Control Unit	Total Timbered acreage	Infested acreage	Timber killed 1944 on infested area (Complete record)		Timber killed 1945 on infested area (Partial record)	
				Trees	MBM	Trees	MBM
A	1 Moraine	15,300		no data		no data	
	2 Wawona	12,360	8,000	140	120	80	75
	3 Alder Creek	14,520	4,000	80	120	70	110
	9 Chilnaulna	12,500		no data		no data	
		<u>54,680</u>	<u>12,000</u>	<u>220</u>	<u>240</u>	<u>150</u>	<u>185</u>
B	4 Chinquapin	11,300	6,000	120	190	90	120
	5 Big Meadows	21,200	10,000	260	210	80	80
	6 Yosemite Valley	9,600	9,000	45	25	50	35
	7 Bridalveil	11,500	3,000	90	23	175	55
	8 Illilouette	29,600		no data		no data	
	10 El Capitan	25,500	6,000	160	80	70	35
	11 Isberg	49,500		no data		no data	
	12 Tenaya	<u>32,500</u>	<u>4,000</u>	<u>120</u>	<u>30</u>	<u>100</u>	<u>25</u>
		190,700	38,000	795	558	565	350
C	13 Carlon	26,880		no data		no data	
	14 White Wolf	25,600	4,000	320	50	190	30
	15 Hetch-Hetchy	85,600		no data		no data	
	16 Tilden	55,000		no data		no data	
	17 Matterhorn	70,000		no data		no data	
	18 Tuolumne	<u>65,000</u>	<u>6,000</u>	<u>400</u>	<u>60</u>	<u>300</u>	<u>50</u>
		328,080	10,000	720	110	490	80

LEGEND

PINE TIMBER STANDS

- Infestation Normal
- " Light
- " Moderate
- " Heavy
- Cut-over, as of

BOUNDARY LINES

- Sierra National Forest
- Entomological Areas
- Insect Control Units
- Pine Timber Type

GROUND SAMPLES

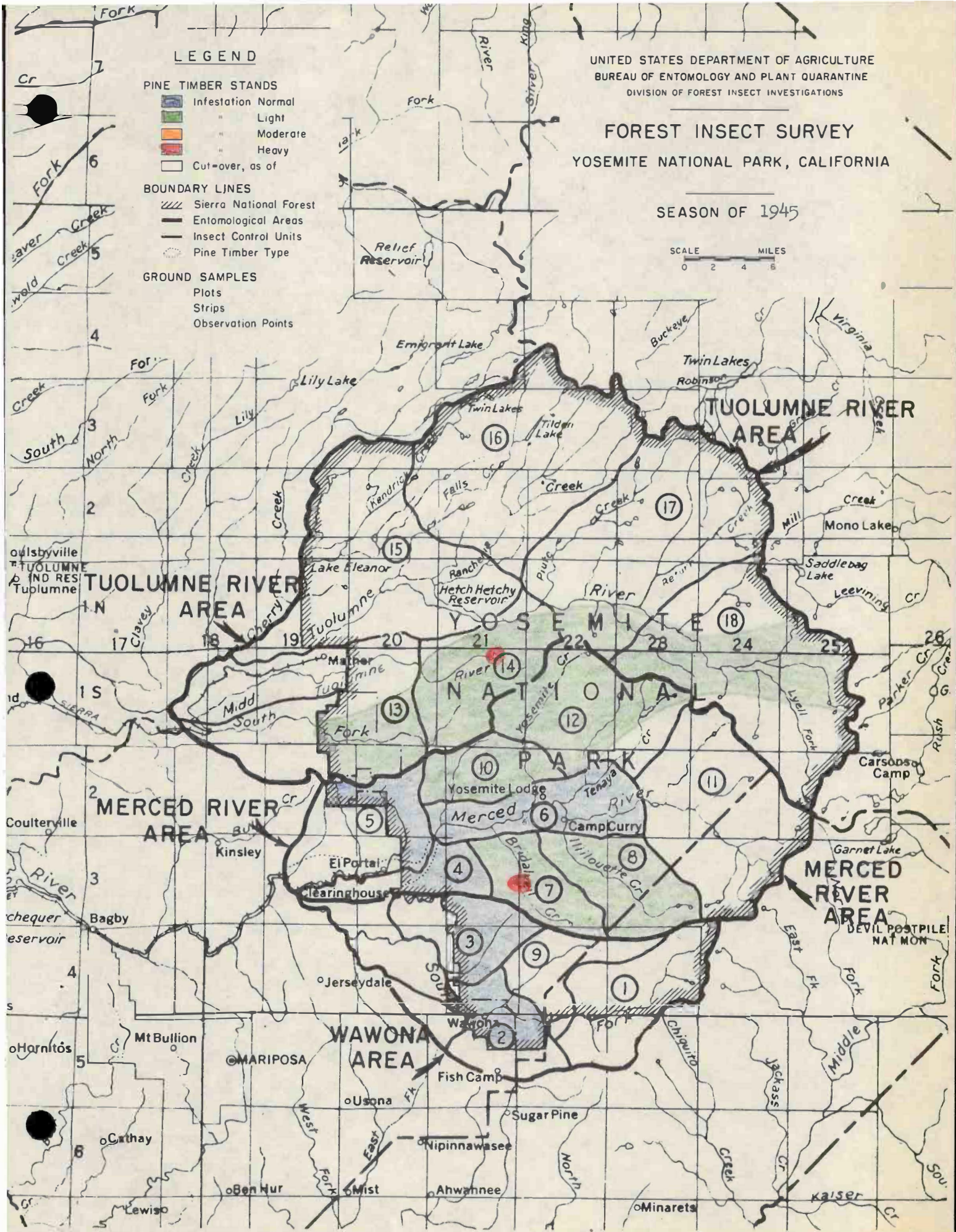
- Plots
- Strips
- Observation Points

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FOREST INSECT SURVEY YOSEMITE NATIONAL PARK, CALIFORNIA

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